

291

4.6

Key p192 12, 13, 20, 28, 30

12.  $5x + 2y = 8$

$2x - 3y = 7$

$$D = \begin{vmatrix} 5 & 2 \\ 2 & -3 \end{vmatrix} \begin{matrix} 4 \\ -19 \end{matrix}$$

-19

$$D_x = \begin{vmatrix} 8 & 2 \\ 7 & -3 \end{vmatrix} \begin{matrix} 14 \\ -24 \end{matrix}$$

-38

$$D_y = \begin{vmatrix} 5 & 8 \\ 2 & -7 \end{vmatrix} \begin{matrix} 16 \\ -35 \end{matrix}$$

19

$$x = \frac{-38}{-19} = 2$$

$$y = \frac{19}{-19} = -1$$

(2, -1)

13.  $2m + 7n = 4$

$m - 2n = -20$

$$D = \begin{vmatrix} 2 & 7 \\ 1 & -2 \end{vmatrix} \begin{matrix} 7 \\ -4 \end{matrix} \quad D_m = \begin{vmatrix} 4 & 7 \\ -20 & -2 \end{vmatrix} \begin{matrix} -140 \\ -8 \end{matrix} \quad D_n = \begin{vmatrix} 2 & 4 \\ 1 & -20 \end{vmatrix} \begin{matrix} 4 \\ -40 \end{matrix}$$

D = -11

 $D_m = 132$  $D_n = -44$ 

$$m = \frac{132}{-11} = -12$$

$$n = \frac{-44}{-11} = 4$$

(-12, 4)

$$28. D = \begin{vmatrix} 1 & -2 & -5 \\ 1 & 2 & -2 \\ 4 & 1 & 1 \end{vmatrix} = 57 \quad D_x = \begin{vmatrix} -1 & -2 & -5 \\ 5 & 2 & -2 \\ -1 & 1 & 1 \end{vmatrix} = -33$$

$$D_y = \begin{vmatrix} 1 & -1 & -5 \\ 1 & 5 & -2 \\ 4 & -1 & 1 \end{vmatrix} = 117 \quad D_z = \begin{vmatrix} 1 & -2 & -1 \\ 1 & 2 & 5 \\ 4 & 1 & -1 \end{vmatrix} = -42$$

$$x = \frac{-33}{57} \quad y = \frac{117}{57} \quad z = \frac{-42}{57}$$

$$\left( -\frac{11}{19}, \frac{39}{19}, -\frac{14}{19} \right)$$

$$30. D = \begin{vmatrix} 4 & 2 & -3 \\ -1 & -3 & 1 \\ 0 & 2 & 8 \end{vmatrix} = -82 \quad D_x = \begin{vmatrix} -32 & 2 & -3 \\ 54 & -3 & 1 \\ 78 & 2 & 8 \end{vmatrix} = -902$$

$$D_y = \begin{vmatrix} 4 & -32 & -3 \\ -1 & 54 & 1 \\ 0 & 78 & 8 \end{vmatrix} = 1394 \quad D_z = \begin{vmatrix} 4 & 2 & -32 \\ -1 & -3 & 54 \\ 0 & 2 & 78 \end{vmatrix} = -1148$$

$$x = \frac{-902}{-82} \quad y = \frac{1394}{-82} \quad z = \frac{-1148}{-82}$$

$$(11, -17, 14)$$